Improving Quality Of Learning At University Through Application Of Blended Learning: a Case Study at SebelasMaret University, Solo, Indonesia

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A B S T R A C T

Objectives of this research isto analyse the implementation of blended learning at Post Graduate Program in SebelasMaret University Solo, Indonesia.This research applies the ***descriptive method*** by using ***qualitative approach***on the specified case study. Location of this research is the Study Program of Education Technology at Post Graduate Program in UNS Solo, Indonesia. Data are collected through interviews, observations, and document analyses. Validity assessment is done by using ***data triangulation*** whereas data analysis is carried out by applying ***interactive analytical technique***.Implementation of ***Blended Learning (BEL)*** at Post Graduate Program in UNS Solo consists of six stages, namely: :determining the kind and material of learning,determining the BEL design to be used, determining the format of ***on-line learning***,performing a test for the design made,assigning special instructors (lecturers / webmasters) andpreparing criteria to perform evaluation on BEL implementation.Perception of lecturers and students upon BEL implementation has not yet been in conformance with the principle of BEL Application. Therefore, regulation is absolutely required for the existence of Blended Learning (BEL) system.

Key-words:*Blended Learning, On-line Learning, Principle of BEL Application*

1. Introduction

At present, development of computer and information technology has come penetrating the educational domain. On-line technology provides facilities for students to get additional information. Availability of theE-Learning facilities also enable students to penetrate partitions of time and place in order to follow the course available through the on-line system. Development of computer technology has the potential to improve quality of education and learning.

Such development of science and technology demands for human resources responsive to the said development. In education sector, development of technology has a very great and significant influence to the selection of learning model based on the available learning theories. In learning process, lecturer as one of the human resources holds an important role for the success and effectiveness of the learning process.

One of the learning theories from cognitive school supporting the success of a lecturer in class is the 'Constructivist Learning Theory'. According to this theory, learning is not merely memorizing the lessons, but learning is a process in constructing the knowledge through experience. Constructivism is an approach to teaching and learning that acknowledge that information can be conveyed but understanding is dependent upon the learner (Casas, 2006). In addition, Chang (2001) stated that "from the viewpoint of recently developed constructivist learning theory, knowledge should not be accepted passively, it should be actively constructed by cognition."

Such learning theories at the beginning were used at the direct or traditional learning method. This kind of learning has not yet utilized the learning aids / equipment nor the learning media through application of ICT (Information, Communication and Technology). Development of ICT causes the presence of on-line learning, web-school or cyber-school learning applying the internet facilities.

There are many definitions about learning applying the internet, such as: on-line learning, distance learning, web-based learning, e-learning (Luik, 2006). Such terminologies make people confused. However, Tsai and Machado (2010) give a definition based on the terminological approach, "Our approach to defining these terms involves two complementary methods. The terminology is analysed based on the individual meaning of the constituting terms, and the meaning of related concepts." Based on the aforesaid subject, they give definitions for the respective terms as follows: (1) E-Learning is mostly related to activities involving computers and interactive networks simultaneously. (2) Online Learning is connected to the contents ready to be accessed at computers. Such contents may be available at the web or internet, or are only installed at CD-ROM or at the computer hard disk. (3) Web-based Learning is related to the learning materials presented at the Web-browser, including as well when the materials are packed into CD-ROM or other media.(Naidu,2006)

Online Learning has superiority in resource richness. Under online learning, lecturers and students can reach very large sources of learning, which cannot be obtained at the face-to-face learning. The weakness of this learning system is that there is no direct interaction between lecturers and students. The loss of this face-to-face interaction causes the non-verbal elements in interaction not properly

conveyed. Lecturers are unable to know directly about the students' non-understanding on materials which are indicated more through the non-verbal symbols.

In order to improve quality of learning, creativity, critical thinking ability of students as well as making learning more meaningful, the Study Program of Education Technology of Post Graduate Program in UNS Solo applies the learning model combining the face-to-face learning and the online learning, namely the "Blended Learning". Blended Learning enables students to choose the learning styles that they prefer. Lecturers apply the Blended Learning Approach because not all students able to follow learning under the online system. Some lecturers use the blended learning to reduce the face-to-face activities and transfer it into the online learning activities, because not all students are able to be present at face-to-face learning. Some educational institutions apply the blended learning to cut-off the educational cost of the traditional system. Hence, there are many reasons why a learning process chooses the blended learning approach. Its main goal is not just to follow the trend on the application of technology in learning, but in reality there is a reason suitable with the goal of learning to be achieved. In this research, the application of blended learning is more emphasized on activities of the students. This approach is used as an effort to improve the communication skill of the target students.

1.1. Problem Formulation

Conventional learning no longer becomes the only thing to fully rely on. In the middle of technological progress at present, variations of method are required in order to provide opportunities to learn by utilizing various kinds of sources, not only from the *manpowe*r, such as lecturers. The required learning is the utilization of elements of information technology, without leaving the pattern of direct guidance from teachers and utilization of larger learning sources. This concept is frequently referred to as the "blending" of *the blended e-learning* and *conventional learning*, so that it is called as *"Blended Learning"*. However, in reality not yet all the lecturers are ready to use this kind of learning model (Suryani, 2010). Apart from readiness of the lecturers, a part of students have not yet got the sufficient skill in this learning model (Suryani, 2011). Even, the learning facilities themselves have not yet been sufficiently available (Suryani, 2011).

1.2. Objectives of this Research

1.2.1. *To analyse implementation blended learning* at Post Graduate Program of UNS Solo, Central Java, Indonesia.

1.2.2. *To analyse the perception of lecturers and students* upon the blended learning model.

1.2.3. *To analyse the constraints at the application* of blended learning model and the steps taken to solve them.

2. Theoretical Orientation

2.1. Blended Learning.

The thoughts and efforts to continuously improve learning implementation at Study Program of Education Technology of Post Graduate Program in UNS Solo need to be continuously implemented. Of course, it is intended to obtain the better outputs. One of them is the effort to

develop the learning model by combining face-to-face traditional learning and online learning. This new approach is -called "Blended Learning" or frequently also known as "Blended E-Learning" abbreviated to "BEL".

Semler (2005) defines as follows: "Blended Learning combines the best aspects of online learning, structural face-to-face activities, and real world practice. Online learning systems, classroom training, and on-the-job experience have major drawbacks by themselves. The blended learning approach uses the strengths of each to counter the other's weaknesses." Further, Driscoll and Carliner (2005) defined "Blended Learning integrates or blends learning programs in different format to achieve a common goal." Thorne (2003) explained about Blended Learning as follows, "It represents an opportunity to integrate the innovative and technological advances offered by online learning with the interaction and participation offered in the best of the traditional learning." Bershin (2004) defined, "Blended learning is a combination of different training media: technologies, activities, and types of events to create an optimum training program for a specific audience. Blended learning programs use many different forms of learning, perhaps complemented with instructor-led training and other live formats." In line with Soekartiwi (2005b), Graham,et.al(2006) stated that this blended learning combined the face-to-face pattern in class and the use of online web.

Blended Learning is a learning method combining / integrating the face-to-face meeting and the online materials harmoniously. Integration between conventional learners in which the teachers and students directly meet at online learning accessible any times and anywhere. Other form of blended learning is the virtual meeting between teachers and students. They might be available at two different places, but they can mutually give feedbacks, ask or answer the questions. All of them are performed at the real time. Some people call it as "Long Distance Instructed Learning", and some others call it "Virtual Instructor Led-Training" guided by Instructor virtually, because both the participant and the instructor are available at two different places. Whatever its name is, this learning model utilized the IT technology through the video media conference, phone conference, or online chatting. (Harding, Kaczynski and Wood, 2005).

Blended Learning consists of two words, namely 'blended' means 'combination/mixture' and 'learning'. Another term commonly applied is "Hybrid Course". Hybrid means 'mixture / combination', and 'course' means 'subject' or 'lecture'. The most common original meaning of 'blended learning' refers to the learning that combines or mixes the face-to-face learning and the computer-based learning (online and offline).

Thorne (2003) illustrates blended learning as follows, "It represents an opportunity to integrated the innovative and technological advances offered by online learning with the interaction and participation offered in the best of traditional learning." Whereas Bershin (2004) defined blended learning as "the combination of different training 'media' (technologies, activities, and types of events) to create an optimum training program for specific audience. The term 'blended' means that traditional instructor-led training is being supplemented with other electronic formats. In the context of this book, blended learning programs use many different forms of e-learning, perhaps complemented with instructor-led training and other live formats." The term 'blended learning' is initially used to illustrate the subjects or lectures combining the face-to-face learning and the online learning.

The idea of learning under the blended learning basis is the learning which combines strategy in conveying the learning using face-to-face activities, computer-based learning (offline)(Cennamo&Kalk, 2005), and online computer (internet and mobile learning.(Duhaney, 2004; Gibson, 2006)Learning under the basis of 'blended learning' was developed around the year 2000 and at present is largely used in North America, England, Australia, universities and the training institutions. Through blended learning, all the learning sources able to facilitate learning for the learners are developed. Blended learning can combine face-to-face learning and computer-based learning. This means that it is the learning with technological approach by combining face-to-face learning sources and the teachers and those published at the media of computer, cellular phone, satellite television channels, video conference, and other electronic media. The learners and the teachers / facilitators cooperate together to improve the learning quality. (see Oliver &Trigwell, 2005; Thorne, 2003; van der Westhuizen&Krige, 2003; Driscoll, 2002; Irons, Keel, &Bielema, 2002). The main goal of blended learning is to provide opportunity to various characteristics of the learners, so that there will be the establishment of independent learning, sustainable, and lifelong development, thus learning will become more effective, more efficient and more interesting.(Rovai and Jordan , 2004)

The use of blended learning approach is based on assumption that there is no absolute superiority of the face-to-face method, and also there is no absolute superiority either of the online learning method. Each has its own respective weakness and superiority.

Face-to-face method still becomes the best way for the learning activities. Its main superiority is supported by its strong interaction between lecturers and students able to present ideal environment for learning. However, not every individual has the same style, speed and need for learning. The face-to-face learning neglects this characteristic.

Some advantages in utilizing the blended learning among others are as follows: (1) Students are free to learn the subject material independently by utilizing the materials available online. (2) Students are able to have a discussion with their lecturers or with other students outside the face-to-face hours. (3) The learning activity conducted by students outside the face-to-face hours can be administered and controlled properly by teachers. (4) Lecturers can add the richness materials through internet facility. (5) Lecturers can ask students to read or to do the test conducted before the learning. (6) Lecturers can hold the quiz, provide the feedbacks, and utilize the test result effectively. (7) Students can mutually share the files with other students. (8) And there are still some other advantages in utilizing the superiority of the internet-based learning.(Seidl, M., 2005).

Various researches indicate that *blended learning* has the superiority compared to the face-to-face learning and to the pure E-learning methods. Blended learning is able to perform learning diversification and fulfil the learning characteristics of various different students. For example, students who are reluctant to have a discussion in class might be more active to have a discussion in writing. Output of the research indicates that Blended Learning is more effective compared to face-to-face learning or E-learning.(Bernard, et al., 2004).

Blended Learning also causes various problems, particularly for the lecturers as follows: (1) Lecturers need to have skill in holding the E-learning. (2) Lecturers need to prepare digital references that can be referred to by students. (3) Lecturers need to design references suitable with or integrated to the face-to-face. (4) Lecturers need to prepare times to manage the internet-based

learning, for example to develop materials, to develop assessment materials and to answer various questions given by students (Kusni, 2010).

2.2. Steps in Blended Learning

This Blended Learning is designed because there is a moment when students need the face-to-face learning apart from the web-based learning. It is not surprising if students do not choose the learning entirely through internet (distance learning), because according to Mayer "… learning using the discovery models is not the only way to facilitate students to easily construct their own knowledge. The well-designed direct method can also help them build their knowledge." (Joyce, et al., 2009).

Such a statement is supported by Luik (2006) who performed a study at students in Estonia using 4 phases for the success of instructional model in learning from Alessi and Trollip (2001), ":model for successful instruction should involve four activities or phases of instruction: (1) presenting information; (2) guiding the learners; (3) practicing; and (4) assessing learning." Further they declare, " since web-based learning could combine different types of educational software tutorials, hypermedia, simulations, drills, etc, it can foster any phase of instruction." Based on the aforesaid phases, Luik (2006) found out that students preferred to choose the web-based learning in phase-3 and phase-4, namely practicing and assessing learning phase (drills, exercises, quizzes and/or tests), whereas phase-1 and phase-2 are preferred to be taken by face-to-face learning (teacher explanations).

As already been explained previously that this Blended Learning allows two learning characteristics, namely synchronous (time dependence) and asynchronous (non-time dependence). Learning under synchronous nature is in conformity with face-to-face learning, namely the time when students and teachers meet directly in class. Meanwhile, learning under asynchronous nature is in conformance with the web-based learning, in which students are able to study anywhere, any time, and not necessarily to meet their teachers. Both the said learning natures will apply the LMS Model.

3. Method Of Research

This research applies *'descriptive method'* under *qualitative approach* with the natural setting, and the specified single case study. (Sutopo, 2006; Sugiyono, 2010; Gall, Gall & Borg, 2007). The place of this research is at Study Program of Education Technology of Post Graduate Program in UNS Solo, Central Java, Indonesia.

Sources of data used in this research cover the source persons / informants, events / activities, and archives or documents. Data collecting is carried out by using the technique of interview, observation, and documentation. Validation of a certain data or verification on the truth of a data are conducted by extending the research period, continuous observation, triangulation, either triangulation for sources of data or for data collecting technique, analysing the negative cases, performing the source check, and discussion with other people or with colleagues. Data analysis is performed in three stages, namely: data reduction, data presentation and conclusion / verification.

4. Outputs Of Research And Discussion.

4.1. Implementation of Blended Learning at the Study Program of Education Technology on Post Graduate Program in UNS Solo.

At the Study Program of Education Technology on Post Graduate Program in UNS Solo, the planning of Blended Learning started in 2009. The E-learning infrastructure has been built, including its networks. The lectures and the additional subjects are completed with the multimedia basic projection system and digital curriculum design applying the WebCT Learning Management System (LMS/claroline). Training for lecturers is also provided and PowerPoint and Words are used to make and prepare materials for *online* teaching-learning (synchronous) or *offline* (asynchronous). These preparation and training reflect the aim of applying the Blended Learning at the Post Graduate in UNS Solo.

Implementation of Blended E-learning (BEL) covers six stages as defined by Steve Slemer (2005) and Soekartawi (2005), as follows:

4.1.1. ***Determining the kind and materials of learning***, then altering such learning materials into the qualified learning materials. Since the learning medium is BEL, the learning material would be better distinguished or designed for three kinds of learning material, namely: Learning materials able to be learned by students themselves; Learning materials able to be learned through the face-to-face interaction; and Learning materials able to be learned through online / web-based learning interaction.

4.1.2. ***Determining the BEL Design to be used.*** Activities in this stage are the most difficult ones. Here, the E-learning expert is required to help. The core of this stage is how to make the learning design containing the components of learning and face-to-face. Therefore, in making this learning design, attention needs to be given to the subjects among others related to: How the learning materials are presented, which learning materials are compulsory to be learned and which one are only suggestion in their nature in order to enrich the knowledge of students, how students are able to access those two learning components and what supporting factors are required. For example, what kind of software is used, whether a work group is required, or whether the learning resource centres in certain areas are needed.

4.1.3. ***Determining the format of online learning,*** whether the learning materials are available at *html format* (so that it can easily be cut and pasted) or at *PDF format* (cannot be cut nor pasted). It also needs to be informed to the students and lecturers the kind of *hosting* is being used, whether such online learning is using the internet link of either Yahoo, Google, MSN, or the others.

4.1.4. ***Performing the Test for Design being made.*** This is intended to know whether the said learning design can be easily implemented or the contrary. The common way applied to perform such a test is by using ***'****pilot test'*. The Pilot Test is the subject on Foundation of Educational Technology. Inputs obtained from participants of Pilot Test, among others is the presence of different perceptions of the BEL participants. Not all participants know well or master the Information Technology.

4.1.5. ***Assigning Special Instructors with the main task*** to serve the questions of students about the procedure how to make registration as participants, about the way how students and other instructors to make access to the learning materials and to others. This Instructor can also serve as a

Public RelationOfficer, because the persons who ask might be the ones not from their own internal groups. They can be the outsiders.

4.1.6. ***Preparing Criteria to Evaluate the BEL Implementation***.Based on the outputs from interview and observation, the finding is obtained that the application of Blended Learning can be efficient and effective if it is implemented in combination, namely ***e-learning*** and ***conventional learning*** are performed together at the percentage of 30 – 70. This can solve the problems of students if they do not understand about a certain material. Lecturers are demanded to always accompany their students, although they act only as facilitators. It can be stated that e-learning serves as supplement for the conventional learning. Both mutually complete each other and each cannot stand alone by itself.

Various efforts in the scheme of Blended Learning development can be conducted following the development of ICT facilities available. It occurs because sometimes the ICT facilities are not completed at the same time. And so are the prototype of learning materials and the instructional design to be used will continuously be developed and evaluated continuously. These are all separated from the institutional support in evaluating such development.

E-learning utilization cannot be separated from the advantages of internet and intranet. The learning techniques available at the internet are so complete, therefore this matter will not influence the tasks of lecturers at the learning process. In the past, the learning-teaching process was mostly dominated by the role of lecturers and textbooks (*Era of Teachers and Books*), and in the future the learning-teaching process will be dominated by the roles of lecturers, book and technology (*Era of Teacher, Book and Technology*).

The e-learning sources can be in the form of static and dynamic sources. *The static sources* are the learning sources that do not undergo any changes on its contents inside, such as the materials in books. *Dynamic sources* are the learning sources undergoing the change every time, pursuant to the progress at the era. Just take the article at website of *computer science.com,* for example, each time it always changes adjusting itself to the available development of technology. This makes students always get the newest and the latest knowledge / information every time.

4.2. Perception of Lecturers and Students to the Implementation of Blended Learning at Study Program of Education Technology on the Post Graduate Program in UNS Solo.

Perception of Lecturers and Students on the Implementation of Blended Learning as the supporting tool at the conventional learning system is not a merely a process in installation of computer and network, but it also requires *readiness of the whole related parties* comprising of the policy maker, lecturers and students. On its development, a simultaneous and balanced attention must be given, so that the e-learning can be utilized as optimum as possible.

The existence of e-learning facility helps the students very much in learning, because the freedom to be able to download the materials is not limited and it can also be accessed by other than the students of Study Program of Education Technology at the Post Graduate Program in UNS Solo. This e-learning is very good in the matter of fulfilling the needs for materials. However, in order to be able to learn the e-learning system independently it really takes time and good handling.

4.3. Constraints encountered in implementing the E-learning at the Study Program of Education Technology on the Post Graduate Program in UNS Solo.

There are a lot of constraints encountered in implementing the E-learning at the Study Program of Education Technology on the Post Graduate Program in UNS Solo, related to the inputs, process, outputs as well as the management. One of the protruded constraints and must be immediately overcome is the updating problems from the e-learning system, commencing from the appearance, news, forum, materials, and other contents supporting the e-learning system. The weak point of management in the matter of system sustainability supervision is that there is no clear rule / regulation, so that the users, in this case are lecturers and students are less attentive to their obligations that they should have done. The other constraint is related to the supporting equipment not yet been meeting the requirements and not yet been sufficiently available. It is absolutely required in order to obtain the maximum result of the system pursuant to the e-learning characteristic which always utilizes the technological services and superiority of computer as the consequence of applying the ***CAI*** (Computer Assistance Instruction) and ***CMI***(Computer Managed Instruction).

4.4. Procedures in Solving the Constraints in implementing the E-learning at Study Program of Education Technology on Post Graduate Program in UNS Solo.

One of the indications whether a Blended Learning is successful or not is based on *the update* of anything available at the e-learning, commencing from the appearance, news, forum, material, and other contents supporting the e-learning system itself. The demand for *'update'* is a must for the e-learning management, because the users later on will evaluate the aforesaid system.

Regulation is absolutely applied to control the existence of *Blended Learning System*, either for the management, for administrator, lecturers and students. This is for the sustainability of good system and the continuous supervision for the quality of the said Blended Learning system.

The qualified and sufficient supporting equipment absolutely need to be fulfilled for the maximum result of the system pursuant to the characteristic of the *Blended Learning* itself which always utilizes technological service and superiority of computer as a consequence of applying the *CAI* (Computer Assistance Instruction) and *CMI* (Computer Managed Instruction).

Knowledge and skill in the field of development and management of electronic learning activities become the determinant factor, apart from the procurement of computer facilities and internet access. Finally, at the implementation of *Blended Learning* as the supporting tool for the conventional learning system, all the related parties, namely the policy maker, lecturers, and students must be ready for the e-learning implementation. In addition, all facilities and the required equipment must be fulfilled first, so that the implementation of e-learning can run smoothly. In its implementation, it may not be carried out halfway, and its future development must always be deeply thought out.

5. Conclusions

5.1. ***Blended Learning planning*** at the Study Program of Education Technology on Post Graduate Program in UNS Solo started in 2009. The E-learning infrastructure has been built, including its networks. The lectures and the additional subjects are completed with the *multimedia basic projection system* and digital *curriculum design* applying the WebCT Learning Management System (LMS). Implementation of *Blended Learning (BEL)* consists of six stages, namely: - determining the kinds and learning materials; determining the BEL design to be used; determining the format of on-line learning; performing the test for the design being made; assigning special instructors and preparing the criteria to evaluate BEL implementation. Blended Learning (BEL) at the Study Program of Technology on the Post Graduate Program Education in UNS Solo is divided into two parts, namely *"Online Based Learning"* and *"Offline BasedLearning"*. The Online Based Learning among others covers browsing, surfing, online forum, online news, email, online download, and the like. Whereas the Offline Based Learning among others covers the use of computer, offline material download, offline forum, offline news, etc.

5.2. ***Perception of lecturers and students*** on the Application of Blended Learning (BEL) is as a supporting tool for the conventional learning system. Therefore, it requires *readiness of the whole related parties*, namely the policy maker, lecturers, and students. In its development, various aspects must be put into our attention, so that e-learning as the supporter for the Blended Learning (BEL) can be used as optimally as possible. The perception given by students is not too much different from that of their lecturers in viewing learning under the BEL (Blended Learning). BEL is only meant as a supplement in providing the learning materials under the basis of information technology. Students feel being assisted by the presence of such e-learning facility, because freedom to download the materials is not limited and it can also be accessed by other than students of Study Program of Education Technology at the Post Graduate Program in UNS Solo**.** This e-learning is very good in fulfilling the needs for materials. However, it really takes time and good handling procedure in order to be able to learn the Blended Learning (BEL) system independently .

5.3. ***Regulation is absolutely required*** for the existence of good Blended Learning System, either for the management, administrator, lecturers and also students. This is for the sustainability of good system and the continuous supervision for the quality of the said Blended Learning System.

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